The Excavating Engineer

Vol. 20 SEPTEMBER 1926 No. 9

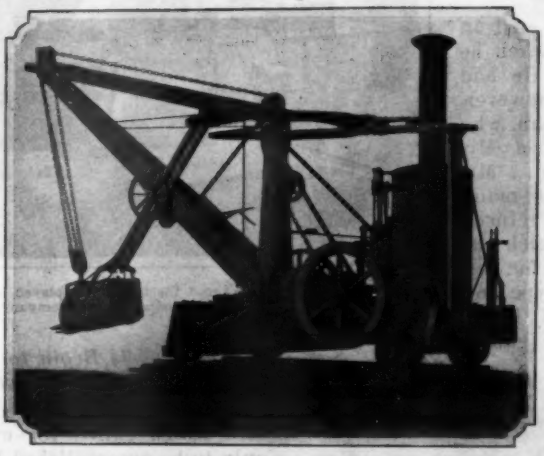
Dry Land Digging—Yesterday and Today

A Brief Illustrated Outline of the Main Developments in the Industry of Mechanical Excavation from the Time of the Early American Steam Shovel to Date

MAN has dug in the earth's surface for countless ages. It is very difficult to say just why his first digging efforts were made, but among the first of his methods was the mere scratching of the ground to facilitate the planting of seeds.

Even in the earliest historic times, digging was undertaken on a very large scale. Some of the earth-moving projects were of such a magnitude that they would be considered large even today.

Of course, the method used in those days relied entirely upon hand labor. Where earth moving was required the laborer filled, with a crude shovel, an earthenware or reed basket which he carried away upon his head after he and a helper had raised it from the ground level and got it nicely balanced. Strange as it may seem to most of us, this method of digging is relied on today in some parts of the world.



The Otis shovel, built in 1837 (illustration reproduced from a drawing made in 1841). This machine is really the great-grand-daddy of the railroad shovel.

Although it can scarcely be called mechanical digging, the first approach to it that we can find was probably due to the laziness of a very early laborer, who working in a shallow pit tied a rope about the shaft of his shovel close to the blade so that another man standing on the bank of the pit might help him lift it to the ground level. By this scheme the man in the pit forced his crude shovel into the earth and with the help of the man on the bank, who hauled on the rope, brought the shovel load to the surface. There is no doubt but that this was the product of laziness, for the shovel was certainly no larger than the hand shovels used today.

The First Steam Shovel

As far as we can find, the first successful mechanical shovel was a steam shovel—an American product. There may have been other devices at about the same time, but apparently a man by the name of Wm. S. Otis worked out the first practical steam shovel. This was built in 1837, by Eastwick & Harrison and was patented on February 24, 1839, the United States patent number being 1089. The only illustration that we have been able to get of the shovel is a reproduction of a drawing by Rufus Mason in Philadelphia in 1841. This first Otis shovel was put to work on a section of the Baltimore & Ohio Railway in Maryland. Later on it was taken to Canada and was used on the first Welland Canal. After that it was mounted on a scow and used as a dredge on the Sioux River. It was wrecked in either the year 1905 or 1906. It is certainly of interest to note that according to this record, the shovel had an active life of almost seventy years.

There is little doubt but that the dredge or floating excavator dates back to before the land machine. The old spoon dredge, one in which a spoon or shovel was thrust down by hand into the river bed (or into earth under water) and was hoisted up above the water surface by block and tackle, was probably the first. It is quite

An early railroad shovel used by the Toledo and Ohio Central Railway. The machine was built by Bucyrus Company in 1882, the picture was taken in 1910.

natural that under-water mechanical excavation should have preceded similar dry land mechanical excavation, for in the former case hand methods were impossible except at a very shallow depth.

The Souther Shovels

Mr. Otis' shovel was still in the experimental stages when he died at the age of 26. He had worked very closely, however, with a man named Chapman, who later joined forces with a Mr. John Souther of Boston. Mr. Souther built shovels for many years, but he consistently refused to change the design, which depended on one engine for all power, was of the boom type and operated on a track of heavy timbers of 7 feet, 10-inch gauge.

This was the last word in quarrying at the time 1888. Chas. A. Strong & Sons shovel at the Cleveland Stone Company, Berea, O.

This lack of desire to change has stamped this period of the life of the shovel industry as one without any advance, and today little is heard of the machines of this period — the type has disappeared entirely except for a few old machines still existent. The most famous earth-moving project and the largest of this period which lapsed between the Otis shovel of 1837 and the year 1870, was the building of the Suez Canal, which during the years of 1859 to 1869 was built by that popular French engineer-hero, Count Ferdinand de Lesseps. Practically all the dry land excavation of this earth-moving project was carried out by hand, although a number of Lubecker machines — a machine similar to an elevator dredge but designed for work on dry land — were used on the job. The under-water digging was handled by open-type bucket dredges.

There can be little doubt about the interest displayed in this shovel — which was new at the time — 1890. Haldeman Stone Company, North Amherst, Ohio.

Steam Shovels Begin to Play an Important Part in Excavation

The year 1880 ushered in an era of many projects which called for excavation in magnitude only to be accomplished by the use of mechanical methods. It was in February 1881 that work was started on the Panama Canal by Count de Lesseps' French Company, which was doomed to such disastrous failure eight years later. The beginning of work on the Panama Canal brought out many a wierd and wonderful method of moving earth, and many a machine which, while promising much, was doomed to ignominious failure. It also was in this decade that the American railroads began expansion.

It was in the following decade, 1890-1900, that the new Panama Canal Company (French) proceeded with the work dropped by the older company, and it was in the same years that the great

expansion of American railroads took place; an expansion which was most certainly made possible only by mechanical methods of digging. Another project which gave great impetus to the

An Early "A"-Frame Shovel

manufacturer of mechanical digging equipment was the digging of the Chicago Drainage Canal, on which shovel work was started in 1892. Most of the mechanical shovels up to this time had been used in soft materials. It was never attempted to put them into anything like the digging which is attempted today. The beginning of the great era of railroad expansion brought about the development of more sturdy machines with dippers up to 2½ cubic yards.

The Crane Shovels

The early shovels, those built in the years 1880 to 1890 — the years which proved that the mechanical shovel industry had really come to stay — were all of the mast type, and followed more or less closely the design of Souther. Then as today there were three motions to the shovel, hoist, crowd and swing, and the greatest development of the time was the introduction of the Thompson shovel (built by Bucyrus Company), which had three engines — one for each motion. The boom or crane as it was called was a triangular-shaped structure supported from both the top and bottom of the mast, and it was at the top of this same mast that the swing circle was located. All the machinery of the shovel of those days was mounted on a car body, which like the railroad-type shovel remained at right angles to the face against which the machine was working and was provided with trucks to support it upon rails for both digging and for transportation. The boom, dipper and dipper sticks, with their swing circle, were the only swinging parts upon the machine.

The Boom-Type Shovel Displaces the Mast Type

The beginning of the following decade, 1890-1900, found the mast-type shovel disappearing and the substitution of the A-frame shovel, which like the railroad-type shovel had a boom (then made of two channel irons), fixed with a bearing at the lower end where was located the swing circle, and with guy rods running from the point of the boom to the top of the A-frame.

In the latter part of the last decade of the nineteenth century (1890 to 1900) the revolving shovel first made its appearance. While it is true that in the early part of this decade a number of revolving machines were attempted, what might be called success was not attained until about 1897 when Captain Thew, a former captain upon an ore boat, plying the Great Lakes, patented a portable shovel which was originally designed to load ore. The revolving shovel, like its forerunner, the railroad-type shovel, developed slowly at first, and as the field for it became larger it gained very rapidly in popularity.

An Early Dragline

The Debut of the Dragline

In the early part of the years from 1900 to 1910, in 1903 to be exact, one of the first successful dragline buckets was used. It was used to excavate a soft mud overburden on Lock No. 28 of the Hennepin Canal. This beginning of the dragline was nothing more than a rectangular

pan quite similar to a wheeled scraper pan, although heavier. It was built by Page & Schnable, and was the development which led to the first successful dragline machine which was produced in 1907.

From the year 1908 the dragline grew in favor, and just as it showed phenomenal growth in the first few years of its existence, so has it shown a steady increase in use right up to the present time.

In giving the date of the first dragline bucket as 1903, it is only fair to mention that in 1884 a scraper bucket was shown in a catalog of the old Osgood Company. This bucket, however, required three lines for its use, and probably for this reason it never found wide use. The early popularity of the dragline was probably due in part to the fact that practically all contractors used a two-drum hoisting engine as standard equipment, and it was comparatively easy to erect a stiff-leg derrick and use the two drums of the hoist for drag and hoist.

A 65-ton shovel at work on the Chicago Drainage Canal in 1894. The owner was the Chicago Gravel Company.

The First Successful Electrically Operated Excavators

The early machines all relied upon the steam engine for their motive power. Apparently the first successful electric excavator was an electric placer dredge built and shipped by Bucyrus Company in 1894. The first successful electrically-driven shovel was a small one and transmitted the power of the electric motor to the various motions through clutches. In July, 1902, the Vulcan Company of Toledo, Ohio, sold what they called their "Baby Giant No. 516" to the Milwaukee Electric Railway and Light Company. It was, however, in October 1907 that this same company shipped to the Western New York and Pennsylvania Traction Company a so-called "Little Giant" 3-motor machine which is now owned by the Mohawk Limestone Products Company of Jordanville, New York, and which today is still in operation.

It was in the last two or three years of the nineteenth century that the first of the larger railroad-type shovels were built. The first ones found use on the Transcontinental railroads, and in the early part of the next ten years, from 1900 to 1910, many of these machines were built for work upon the Panama Canal. The opening of the Minnesota Iron Range created a further need for these heavy shovels.

In 1910, Jesse A. Shearer and Peter Mayer introduced the slackline cableway excavator.

It was in the first part of the following ten years, 1910 to 1920, that the big stripping shovels were developed.

It is true that earlier stripping had been done, as on phosphate beds in the South, but it was the latter part of this decade which saw the introduction of the machine which was destined to be the forerunner of the huge stripping shovels which today are equipped with dippers as large as 10 cubic yards.

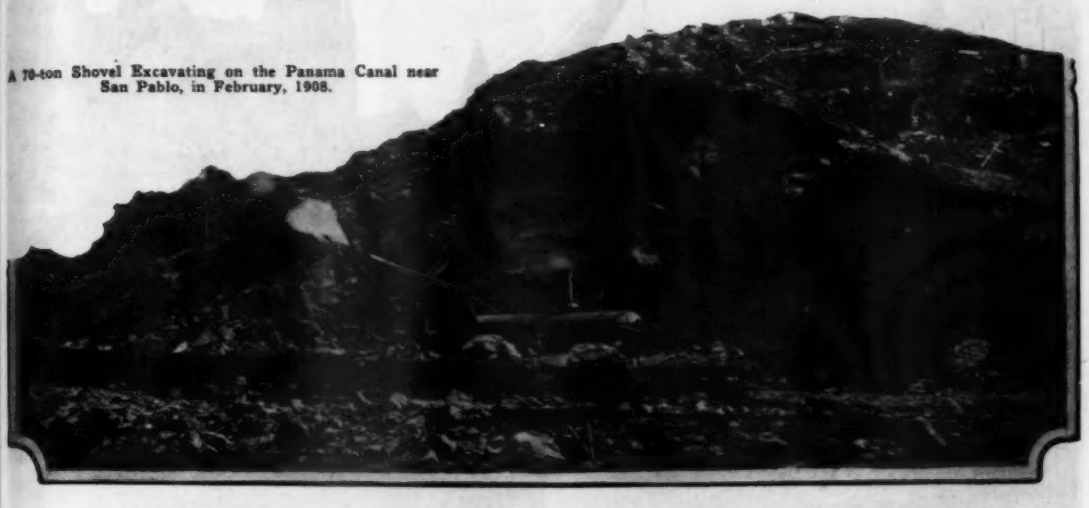
The Introduction of Caterpillar Mounting for Shovels

Up to the beginning of the years 1910 to 1920, the mounting of shovels had been on either railroad trucks or wide steel wheels, either with or without traction. In the year 1911 the caterpillar mounting was introduced for use on revolving shovels. The first machine with this type of mounting was probably a Bucyrus dragline built in 1911, and sold to the Rio Grande Construction Company in Texas.

The first successful dry land gasoline excavator was probably a Bucyrus Class-14 dragline built in 1911. In 1914 Pawling & Harnischfeger built their first gasoline shovel and it deserves mention that the fundamentals of this design have been retained up to their present machine.

The Diesel Engine First Applied to Shovels as Motive Power

The details of shovels, both revolving and railroad-type, remained very much the same until 1925; there were, however, two very important innovations. The first of these was the introduction of the Diesel engine convertible shovel and dragline by the Bucyrus Company, which shipped



A 70-ton Shovel Excavating on the Panama Canal near San Pablo, in February, 1908.

in August 1922 this first Diesel powered machine. The second important change during this decade was the introduction, by the same company, of caterpillar mounting for railroad-type shovels.

Revolving Shovels for Work Formerly Considered Too Heavy for Any but Railroad Shovels

Up to 1925 the railroad shovel, the direct descendant of the early shovel of 1837, was the

An early small revolving shovel with split boom of two channel bars and inside dipper sticks. Note the horse-drawn dump car.

only shovel with strength and power sufficient to stand up adequately against the heavy grief of quarry and mine operation, and yet it did not have the great advantage of mobility and full circle swing which was inherent in the small revolving shovel introduced in 1890-1900. The year 1925 saw the introduction of a heavy-duty full revolving machine combining both the advantages of the small revolving type and the railroad-type, bringing to the excavators of rock, a machine with the same mobility, long possessed by shovels originally built for light work.

Caterpillars for the Largest Stripping Shovels Introduced

This year has seen still another startling change in mechanical shovels, namely, the placing of caterpillar mounting under the huge eight-yard stripping machines such as the Bucyrus 320-B shovel and Class-320 dragline and the Marion Model 350 — and who can tell what will follow? Our outline, is, of course, extremely brief, space does not permit the story of many a detail of the amazing development of excavating machinery. If inaccuracies have crept into our outline, or if you have other interesting stories to add, do not hesitate to send them to us.

It is with extreme regret that we learn of the death of Arthur McMullen, well-known contractor of many years successful experience. Mr. McMullen, who made his home in New Canaan, Connecticut, and who was building part of the new New York Subway at the time of his death, was struck by a taxicab in New York City on the evening of Tuesday, August 16th, and died the following morning. Mr. McMullen's first contracting work was railroad construction in the west and he came to New York City in 1893. He had the distinction of first using caisson work in connection with building foundations for the Commercial Cable Building on Broad Street in 1905. Many tunnels and the foundations of many bridges, in the vicinity of New York City, are monuments to his success in his chosen field.

Photo by Underwood & Underwood

An electric shovel, a Bucyrus 20-B, working as a crane, loading a big Mack truck with material raised to the street level through hole left in the deck covering from the subway excavation being carried on below.

An open cut on St. Nicholas Avenue looking north from 130th Street. Since no cross traffic was encountered on this street, half of the work was open cut and the other half was decked over. The shovel in the foreground, a Bucyrus 20-B, served motor trucks which drove out of the excavation, under their own power, on the ramp in the background. A large amount of material taken out of the cuts on the subway work is being used for the extension of Riverside Park along the Hudson River.

Central mixing plant on the Rosoff Construction Company's, Inc., job on St. Nicholas Avenue between 122nd Street and 132nd Street. The mixer, a Rex S-28 machine, is fed from the large hopper above, which in turn is fed by a derrick using a clamshell bucket. The hopper has two compartments, one for sand and one for stone. Cement is stored in the small house on the left side of the hopper, the bags being sent down a chute from the street level. From the hopper the material goes into measuring buckets which are dumped automatically into the mixer; the cement is fed to the mixer by belt conveyor.

The hopper in the foreground on the decking of the subway is high enough to permit a truck to back up underneath it and to receive the mixed concrete. Note the six-story building at the left, right on the edge of the cut.

Building New York's New Municipal Subways

By Benjamin Berman

A Brief Story of the Big City's Present Subway Construction with an Outline of Previous Work. Containing in Addition to the General Story, by an Engineer of the Rosoff Subway Construction Company, Short Surveys of the Work of Several of the Contractors on Other Sections of the Job.

SUBWAY building in New York City had its beginning in 1870. Even at that time the city was confronted with transit problems which to some minds could only be solved by a subway. In order to prove that such a system of transit was what New York City needed, the Beach Pneumatic Railway Company secretly built a subway of about 300 feet in length under Broadway between Park Place and Murray Street. This model subway contained a car which was driven back and forth by compressed air. The demonstration, however, could not gain the favor of the people and the subway was soon abandoned and forgotten only to be unearthed again in 1912 when the Present Broadway line was being built.

The First Practical Subway in Operation in October 1904

In spite of this futile demonstration the subject of subway transit was continually kept alive. During the nineties, the subject became one of great importance, and the steps that were taken during that period led to a program of subway building which materialized. On January 15, 1900, the first contract was awarded for the construction of a subway which now forms part of the present system. Actual construction of this line started on March 24 of that year, and on October 27, 1904, this subway was ready for operation and trains were put into service. The original subway extended from Brooklyn Bridge to 145th Street and Broadway, a distance of eight miles. Today there are 619 miles of subway and "L" tracks in the city which are being operated by two companies, namely, The Interborough Rapid Transit Co. and the Brooklyn Manhattan Transit Corporation. Of the 619 miles of track the Interborough controls 361 miles, of which 222 miles are subway lines and 139 miles are elevated lines. The remaining 258 miles comprise the Brooklyn Manhattan Transit Corporation system.

The Present Systems with 619 Miles of Subway and Elevated Tracks Cost 600 Million Dollars

These two subway systems cost 600 million dollars. The city's share of this sum is 312 millions, that of the Interborough is 200 millions, while that of the Brooklyn Manhattan Transit Corporation is 88 millions. The subway tunnels, roadbeds, rails and stations of these lines are owned by the city, while the subway cars, engines and other equipment are paid for by the Interborough and Brooklyn Manhattan Transit Corporation to whom the city leased its subway property until 1965. The title to equipment belongs to the city except on subways built before 1913.

In 1965, however, all of the subway property will belong to the city.

This system of subway operation had to be followed as the city had no right to plan, build and operate their own rapid transit lines prior to 1924. By an act of the State Legislature, which went into effect July 1924, the City of New York is enabled, through a Board of Transportation consisting of three members appointed by the mayor for six-year terms, to design, plan and operate new subway lines independent of the present ones. Immediately upon the passage of this act, the Board was appointed and began to function.

Map Showing Location of Present and Contemplated Subway Work in New York City

Plans of Board of Transportation Which Came Into Being in 1924

The Board of Transportation to date has plans for 55 miles of new subway routes of which 40 miles have already been approved. The plan provides for a four-track system. Two lines will be for local traffic and two for express traffic. The total number of service tracks in the new line will be 169 miles. The total cost will be in the neighborhood of 500 million dollars, of which 350 million dollars will be for construction and 150 million dollars for rolling stock and equipment. To this the city intends to add the existing Culver Line. By the terms of its contract with the operating companies the city has the right to buy back any part of the existing system by paying an amount stipulated in the contract.

Municipal Subway System Work Started in March 1925

It wasn't long after the initial plans of the new subway were approved that an event of momentous importance was recorded in the history of the City of New York. On March 14, 1925, ground was first broken by Ex-Mayor John F. Hylan for the first municipally owned and operated subway system in the metropolis. The ceremonies took place on the section of the Rosoff Subway Construction Co. of New York City, which started construction on April 4, 1925.

Contracts for the construction of this new subway system are at present being let out in half-mile sections, with the time limits so arranged that the part of the system in Manhattan will be ready for operation in 1928. To date contracts covering a distance of ten miles have been awarded.

Cut and Cover Method Being Used Extensively

With the exception of the rock tunnel under Fort Washington Avenue and the tunnels underneath the East River, the Harlem River, Gowanus Canal and Newton Creek, the general method of excavation is trench excavation under cover. This method keeps the streets always open to traffic, which according to the conditions in the contract must not be interrupted. Where conditions permit the

Photo by Underwood & Underwood

An air shovel at work on Arthur A. Johnson Corporation's job on Central Park West. As can be seen from the picture, this work is being carried on by the cut and cover method. It is interesting to note the large amount of water in the excavation. Note the suction hose shown in the central foreground and the heavy wire rope mat on the right-hand side of the picture, used to cover the holes while dynamited and to confine the flying rock. On some of the present New York Subway work skips, as shown at the right side of the picture, are loaded by the shovel and hauled out through openings in the temporary roadbed above by small cranes.

open cut is used, but such instances at present are rare. The general scheme in the cut and cover method is to excavate half the width of the street to a depth of about three feet. This cut is just deep enough to receive the 24-inch I-beams which support the decking that forms the temporary roadway until the subway is completed. Traffic is then diverted to the decked roadway while the remaining width of the street is excavated and decked. The full width of the street is then thrown open to traffic which is no longer interrupted. Excavation to the subgrade of the subway, which varies from 20 to 40 feet below the original street level, is carried on by the aid of ramps which are usually constructed on the side streets and lead down underneath the decking. This enables trucks to go down into the subway cut where they are loaded by steam, air or electric shovels which gradually cut their way down to subgrade. To support the decking as excavation continues, posts which are properly braced are set underneath the 24-inch I-beams. By this means the original decking is not disturbed throughout the entire duration of the job when it is replaced by the new permanent roadway.

...wing a temporary roadway on St. Nicholas Avenue. The ...sign just at the left of the center of the picture cautions all ...ers that axle loads are restricted to 10 tons. The pipe crossing ...e road is a 48-inch gas pipe carried overhead to allow the subway work to proceed; the gas pipe supplying the buildings on the ...st will be seen at the surface along the curb.

To further prosecute the work of construction, working shafts are cut through the decking at different points along the line. By the aid of cranes, which are located on the street near these shafts, loaded skips or buckets are raised to the surface and are then dumped directly into trucks.

There are some sections where the ramp method of excavation is not being used. Excavation at these places is being carried on by means of gantry cranes or telphers which are built up on the street surface. These cranes are situated so as not to interfere with traffic.

Only Light Charges of Dynamite May Be Used

Rock excavation is carried on by the use of light charges of dynamite in order to safeguard the timbering and the buildings along the line.

The problems that enter into the job of subway construction are many. In excavating through a city street one encounters the arteries

Photo by Underwood & Underwood

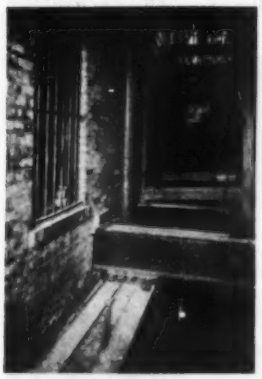
Looking down the partially completed subway on Central Park West on Arthur A. Johnson Corporation's work between 79th Street and 89th Street. Note that three Bucyrus air-driven 1-yard shovels may be seen in this section of the work. Note the air lines coming down to the shovels from the street surface.

of the public utilities, such as gas pipes, electric cables, telephone and telegraph lines, pneumatic mail tubes and sewers. These cannot be interrupted without paralyzing the life of the city. It is therefore necessary before excavation through a street can take place to make provisions for the continuance of these services. The gas lines are by-passed either overhead or on the street surface. Water lines, electric cables, etc., are suspended from the beams underneath the decking. Sewers which have to be disturbed are usually replaced by temporary flumes until the new sewer line is built. Where it is an advantage, however, the new sewer line is built first.

Great Care Exercised with Building Alongside the Excavation

Another condition that presents itself to the subway builder is the safeguarding of the struc-

tures that border on the subway. As the subgrade of the subway is from 10 to 30 feet lower than the bottoms of the foundations of the adjacent buildings, precautionary measures must be taken to prevent the buildings from collapsing as a result of the movement, toward the subway cut, of the material underlying the buildings. This condition is taken care of by underpinning the buildings. As the new subway line passes through a thickly populated section of the city, a large part of the construction is being devoted to underpinning. This work like all other phases of the job is being carried on without interrupting the regular use of the buildings.



In many places the subway work necessitated the temporary support of buildings during the digging. This illustrates the manner used in underpinning buildings with needles.

The different sections of the subway now under construction form a continuous line of operations extending from 28th Street and 8th Avenue to 212th Street and Broadway. The following is a list of these sections together with the names of the contractors and the bid price of each:

EIGHTH AVENUE

28th-38th Streets, Rosoff Subway Construction Co.	$6,252,000
38th-48th Streets, C. H. Locher	7,866,000
48th-58th Streets, Heyman & Goodman	6,840,000
58th-68th Streets, F. L. Cranford	5,970,000

CENTRAL PARK WEST

68th- 79th Streets, J. F. Cogan	$4,190,875
79th- 89th Streets, A. A. Johnson	3,650,632
89th-100th Streets, T. A. Gillespie	3,997,749
100th-111th Streets, Rosenthal Engineering Co.	5,246,633

EIGHTH AVENUE

111th-122nd Streets, Heyman & Goodman	$4,908,261

ST. NICHOLAS AVENUE

122nd-132nd Streets, Rosoff Subway Construction Co.	$4,689,775
132nd-141st Streets, George J. Atwell	3,375,590
141st -149th Streets, La Rocca Construction Corp.	4,710,000
149th -160th Streets, Rogers & Hagerty	4,298,833
160th -Broadway and 173rd Streets, Rogers & Hagerty	7,321,178

BROADWAY AND 173rd STREETS

(At Broadway Temple), Moranti & Raymond	$ 151,740

FORT WASHINGTON AVENUE AND 173rd STREETS

(At Public School 173rd Street), Rosenthal Eng. Co.	$ 240,000

FORT WASHINGTON AVENUE

174th-184th Streets, Michael Del Balso	$3,382,200
184th-193rd Streets, Mason & Hanger Co.	1,967,641
193rd-Broadway and Dyckman, Arthur McMullen Co.	3,225,000
Broadway and Dyckman-212th Streets, Mason & Hanger Co.	3,600,000

The Work of the Rosoff Subway Construction Company, Inc.

As this is written more than 60 per cent of the Rosoff Subway Construction Company's contract on Section 3-A of Route 78 has been completed in 30 per cent of the required time. Similar progress is being displayed by the company on Section 3 of Route 102, which is another one of its contracts on which operations were started in March 1926.

This compressor plant on Rosoff Subway Construction Company's job is composed of two Chicago Pneumatic compressors with a capacity of 1125 cubic feet at 100 pounds pressure.

When the conditions under which this progress on Section 3-A, Route 78, has been made are known, the figures given become more interesting. In the distance of one-half mile which this contract covers, the excavation passed through rock, earth and a rock fill where there was at one time a creek. Old maps of the city show this creek and indicate that it was navigable. At this point a constant flow of water made it necessary to install a sump and pumping machinery to keep the level of the water below the subgrade of the subway.

A ¾-Yard Steam Shovel Loading One of the Big Pieces of Rock by Fastening It to a Dipper Tooth with a Chain

Added to this was a large underpinning program. This part of the job which is now completed involved the underpinning of 65 buildings. The particular construction used to permanently

support the buildings was to set concrete piers at the points where the loads of the structure were concentrated. Where necessary the distance between piers was spanned by reinforced concrete girders. There were also a number of instances where piles had to be driven before the piers could be set.

Part of the job on Section 3-A, Route 78, passes by the foot of the outcrop of rock which abruptly separates the low land from the high land in this neighborhood. This hill rises about 60 feet above the level of St. Nicholas Avenue, through which the subway is being cut. As no

Showing the erection of the permanent steel. This picture was taken at a point where part of the work was carried on in an open cut and part under cover.

traffic feeds down from this hill into St. Nicholas Avenue at this point, advantage was taken of this condition by using the open-cut method of excavation for half the width of the street. The remaining half was excavated by the cut and cover method like the rest of the job.

This hill was taken advantage of in more ways than one. The top, being more or less in an out-of-the-way place, as far as the public is concerned, but easily accessible from the job by a side street, was chosen as the storage yard. The machine shop, blacksmith shop, saw mill and compressor house are also located here. It also proved to be an ideal location for the central mixing plant, which discharges the concrete directly into trucks on the street below, from where it is distributed to the various parts of the job.

Construction operations on this job are so arranged that every succeeding operation follows directly on the preceding one. As a result of this arrangement, the job in its present condition has in plain view every step in subway construction from initial excavation to a completed portion of the structure where decking has been removed and the permanent roadway is ready to take its place.

The work of construction of the Rosoff Subway Construction Co. is being carried on under the direct and active supervision of the officers of the company of which Samuel R. Rosoff is president; Arthur H. Diamant, vice-president; and Harry C. Sanford, chief engineer. Noteworthy mention is also made of the work of Dan McLean, superintendent, and Fred W. Stiefel, construction engineer.

The Work of the T. A. Gillespie Company

The T. A. Gillespie Company has to date completed 40 per cent of its contract. They started work on August 1, 1925, and expect to complete the excavation work March 1, 1927, and their entire section by December 31, 1927. The work is being handled with shovels served by trucks running in on ramps. Their equipment consists of

A ¾-Yard Steam-Driven Shovel Loading an International Harvester Motor Truck

two Bucyrus 30-B air tunnel shovels, two 30-B steam shovels, two 1300-cubic-foot Ingersoll-Rand compressors, one 1100-cubic-foot Chicago Pneumatic compressor, one 500 cubic-foot Chicago Pneumatic compressor, one Brown Hoist caterpillar crane, one Northwest caterpillar crane, one Keystone gasoline excavator and one Universal truck crane.

The Work of Mason & Hanger Company

Mason & Hanger Company, well known in the field of tunnel excavation, have completed 17½ per cent of their earth excavation and 11 per cent of their rock excavation. Work on their section was started February 1, 1926, and they expect to finish the excavation by July 1, 1927, the entire job by July 1, 1928. The shovel, ramp and truck method is used for the main excavation

One of the Mack trucks on the job of the La Rocca Construction Company Corporation's work pulling up out of the excavation. By means of ramps similar to this the shovels at work on the New York Subway are served directly by motor trucks, although working in covered cuts.

below decking and for the main stripping. For trimming, cleaning up and stripping, cranes served by trucks are used. The equipment on this section includes three Bucyrus 20-B air shovels, two Marion Model 32 air shovels, one Erie Model B steam shovel, four Northwest gasoline cranes, two Hoar mucking machines and three Ingersoll-Rand 1300-cubic-foot compressors. William R. Ury is general superintendent, William Graves, night superintendent, and Harvey Ury, H. F. Harmon, John Cunningham and W. M. Bragg are ramp superintendents. The shovel operators are W. S. Redman, Edward Malloy, J. L. Maher, C. L. Butler and Chas. Howe.

The Work of Chas. H. Locher Company

The Chas. H. Locher Company have contracts for two sections. Section 6 was started November 1, 1925, and Section 4 was started January 1, 1926, each section calls for completion 36 months from date of signing contract. These sections are being handled by shovels without ramps, partly by regular methods and partly by special methods. Four Marion 1¼-yard shovels are handling the digging on these two sections, and other equipment on the job includes Ingersoll-Rand compressors, Northwest cranes, P. & H. ground hoists, Universal truck crane, telpherage cranes of special design, concrete plant supplied by the Blaw-Knox Co., Koehring mixers, American hoist derricks, Lidgerwood hoists. The superintendents for Chas. H. Locker Company are H. L. Robinson and Henry Hanson.

The Work of J. F. Cogan Company

Fifty per cent of the J. F. Cogan Company's contract is completed to date. Work on this section was started in August 1925 and it is expected that the excavation will be completed in May 1927 and the entire job in June 1928. The ramp and truck method with shovels is being used here with hoists in the bottom. The equipment on the job consists of two Bucyrus 20-B shovels, one Northwest shovel, two Northwest cranes, four stiff-leg derricks and four hoists. The superintendent is John R. McGonegal and the shovel operators are Geo. Gleason and Jas. McGonegal.

The Work of The La Rocca Construction Corporation

The La Rocca Construction Corporation started work on April 22, 1926, and to date have completed approximately 5 per cent of the excavation work. They expect to complete excavation work within twenty months from starting date and the entire section within 33 months. The excavation is being handled by shovels, served by trucks run in on ramps, as well as by the use of cranes and trucks loaded on the street level. Two Marion No. 32 electric shovels are handling the excavation. Other equipment on the job includes fifteen Mack trucks, two Link-Belt cranes and one Byers Bearcat. George H. Clark is the general superintendent and chief engineer on the job.

Mr. Arthur H. Diamant, vice-president of the Rosoff Subway Construction Company, measuring up some odds and ends on a fill at Hancock Square, 123rd Street at St. Nicholas Avenue. It is interesting to note that Mr. Diamant, who put in this rock fill, some years ago, now has the job of taking it out again.

The Work of The Heyman & Goodman Company

On March 4, 1925, the Heyman & Goodman Company started work on their section and to date have completed about 90 per cent of their work. They expect to complete their entire section about March 1927. They are handling the excavation work with four Bucyrus ¾-yard electric tunnel shovels and four Marion 1-yard electric tunnel shovels served by trucks run in on ramps, also surface cranes. Before excavation work could proceed some 109 elevated columns had to be underpinned to five feet below subgrade. The other equipment on the job consists of electric hoists, electric pumps, cranes, central concreting plant, etc. Luke White is superintendent

for the Heyman & Goodman Company, and Steve Sullivan, John Canfield and Morris Walsh are the shovel operators.

A Summary of Equipment on This Work

A recent analysis of the shovels on the job gives the following information:

Rosoff Subway Construction Co. — Two Bucyrus 20-B electric tunnel shovels, three Bucyrus 20-B high-lift steam shovels, one Osgood air tunnel shovel.

Chas. H. Locher Co. — Two Marion Model 32 air shovels.

Heyman & Goodman Co. — Four Bucyrus 20-B electric tunnel shovels, four Marion 1-yard electric tunnel shovels.

J. F. Cogan Co. — Two Bucyrus 20-B electric tunnel shovels, one Northwest revolving shovel.

Mason & Hanger Company — Three Bucyrus 20-B air tunnel shovels, two Marion Model 32 air tunnel shovels, one Erie Model B steam shovel.

Arthur McMullen — One Bucyrus 20-B air tunnel shovel, one Bucyrus 50-B steam shovel, one Massillon air tunnel shovel.

Atwell, Guston & Morris — One Osgood 29 steam shovel, one Erie steam shovel, one Erie gasoline air shovel, two Link-Belt gasoline shovels.

Arthur A. Johnson — Four Bucyrus 20-B air tunnel shovels, one Erie B, one P. & H. gasoline, and one Northwest gasoline shovel.

Rosenthal Engineering Company — Two Bucyrus 20-B and one Bucyrus 30-B air tunnel shovels, two Bucyrus 20-B steam shovels, one Osgood 18 shovel.

Rogers & Hagerty — Two Bucyrus 20-B and one Bucyrus 30-B air tunnel shovels, five Marion air-driven railroad-type shovels, one Osgood air railroad-type shovel, three Marion Model 32 (steam and air) shovels.

Michael Del Balso — Two Bucyrus 20-B and one Bucyrus 30-B air tunnel shovels, one Bucyrus steam shovel and one Thew A-1.

La Rocca Construction Corporation — Two Marion Model 32 electric shovels.

T. A. Gillespie Company — Two Bucyrus 30-B steam shovels, two Bucyrus 30-B air tunnel shovels.

Frederick Cranford, Inc. — Two Marion 32 air tunnel shovels.

George H. Flinn Corporation — Two Bucyrus 20-B air tunnel shovels.

Moranti & Raymond — One Osgood air shovel.

An analysis of cranes and clamshell machines showed the following: 20 Northwest, owned by Rosoff, Rogers & Hagerty, Cranford, Mason & Hanger, Locher, J. F. Cogan Company, T. A. Gillespie Company; 11 Brown Hoists, owned by Gillespie, Rosenthal, McMullen and Del Balso; 2 Link-Belt cranes owned by La Rocca and a number of smaller cranes of other manufacture.

An air shovel operating on the work of T. A. Gillespie on Central Park West between 89th and 100th Streets. Note the heavy rock material being handled at this place. The truck in this picture is one belonging to the Camwell Contracting Company, Inc.

An Old Timer

The accompanying illustration shows Mr. Charles Hadley of 401 South Ohio Street, Iola, Kansas. Mr. Hadley deserves a special mention as he operated a shovel for twenty-one years.

The machine which has been in Mr. Hadley's care for so long is a Thew No. 2, owned by the Union Brick Company at Iola, Kansas.

We are indebted to Mr. Victor F. Perkins of Gas, Kansas, for this snapshot and information.

It is interesting to note that Mr. Hadley went to work in the same year that *The Excavating Engineer* (then *The Steam Shovel News*) was founded.

If there is any shovel operator, cranesman or fireman can equal or surpass this record, he is invited to send his name, address and picture to *The Excavating Engineer.*

Big Jack McCaughey and the Dragline

It was at the letting of the Northwest section of the Chicago Drainage Canal, and it was early in the first years of the century. "Big Jack" McCaughey was attending the opening of the bids.

The job was a big one and everyone there was interested. The high bid was 65 cents and the low bid was 35 cents per cubic yard. The low bid was "Big Jack's," who was planning, like the others, on doing the job with graders; he was sitting back pretty well satisfied with things in general when another bid was opened and the price of 19.9 cents per cubic yard was read. It was too much for Mr. McCaughey, and his rich, deep voice boomed out "I'd like to see the 'son of a gun' who made them figures," and then another big fellow stood up and claimed the bid as his.

"Big Jack" apologized for his somewhat enthusiastic description of the man and asked him "How the divil he was goin' to do it?"

"Come and see me do it!" was the retort.

. . . . . .

"Big Jack" was telling Hal Riley about it later. "Do you mind the letting awhile back and the man with the 19.90c bid? Well, he sent me a special invitation he did," said McCaughey speaking of the low bidder. "And I went out there and he has a machine with a big long boom and a five-yard can hanging from the end of it and he scoops up five yards at a time with the d - - n thing. It was only a year ago that I was working on a job, and saving all the side borrow to do after the frost set in and just about then a feller came along with one of these new-fangled spreader plows and took the job right out of my hands — and now comes a fellow with a d - - n contraption he calls a dragline and handles another job, I was counting on, for 19.90 cents. Now, tell me, what the h - - l is going to become of a team man."

Our thanks are due to Mr. Hal Riley of Clapp, Riley and Hall, for this little story of old times.

The Stripping Contractor of 1926

J. Robert Bazley Regularly Visits His Stripping Operations by Aeroplane

Mr. J. Robert Bazley of Pottsville, Pennsylvania, who has several stripping operations located within a radius of fifty miles of Pottsville, has very recently adopted a most novel and up-to-date system of covering his work.

Two or three times a week, Mr. Bazley uses an aeroplane, leaving Pottsville at seven in the morning, and is able to cover his entire work in somewhere over an hour, and communicates with his several superintendents by means of messages attached to a rubber ball which he drops from the aeroplane.

This experiment was tried out a couple of weeks ago and proved so successful that Mr. Bazley is arranging to make his tri-weekly trips by aeroplane, after each trip returning to his office and communicating with his foreman on each job. This does not, however, prevent his visiting the work by motor car, and by this method of transportation, he covers annually, about three thousand miles per month.

Many of us can recall the days when we covered work of almost as great a magnitude either on horseback or on a buckboard, and were unable to visit the job oftener than about once a week.

Mr. Bazley's present-day method is an indication of his aggressiveness in prosecuting his work.

Excavation Costs on the Chicago Drainage Canal

While many persons who were closely connected with the work on the Chicago Drainage Canal will remember this, it may be new to quite a few. The work on the canal was let in a number of sections, and, surprising as it may seem, the first section was the most expensive; the second, third and fourth each cheaper than the last, and the last section was let for 12½¢ per cubic yard.

The Excavating Engineer

A Monthly Publication Devoted to Excavating and Allied Subjects

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THE EXCAVATING ENGINEER PUBLISHING CO.
F. O. WYSE, Manager-Editor
South Milwaukee, Wisconsin
Printed in the U. S. A.

Our History

Twenty-one years ago this paper was established as a quarterly known as *"The Steam Shovel News."* The success of the paper among the operators of excavating machinery led the owners in 1906 to make the magazine a monthly, and as a monthly it was published under the name *"The Steam Shovel News"* until the issue for September 1912. With the October 1912 issue the name became its present one, *"The Excavating Engineer."*

This year marks our twenty-first anniversary, and our twentieth anniversary as a monthly magazine. Because of this we have tried to make this a rather special issue, and have titled it "The Twentieth Anniversary Number." It is our sincere hope that the readers will take the opportunity to write us with any criticisms or suggestions they may have for the betterment of the paper, or to make the paper more fully serve their needs.

It is hoped also that many readers — owners and operators who have for some time not contributed — will take the opportunity of sending us a little story (with pictures) of their work.

A Review of Conditions

Even the most persistent pessimists have now been convinced that 1926 is to be another record year. Those who persist in predicting poor conditions for the future have been obliged to put off the date for the fulfillment of their prophecy. They originally promised us a slump for Spring, which failed to materialize, and now the midsummer decline has been less than the regular seasonal falling off.

Unquestionably the promising future for agriculture and manufacturing industries is reflected in the recent high prices of stocks on the New York exchange; although we should not make the mistake, these days, of looking to the stock market as a definite barometer, for the operation of the Federal reserve system has relieved business to a great extent from the heart-breaking fluctuations caused by ill-considered speculation. At present the market seems to be in very strong hands. The activity as this is written is mainly due to the operations of professionals and traders of the millionaire variety who deal in large blocks of stocks. The public in general, however, is also in the market quite heavily, although not on the same scale as last year. It seems, therefore, as if business in general will respond less quickly to any future easing of prices on the stock market.

The money situation is comparatively easy. Those who are in close touch with the situation do not look for any sharp advances. At the present the market seems to be in the state of equilibrium with chances pointing toward modern advances as money is needed to move the crops and to finance Fall trade.

The farmers' situation is good. The winter wheat crop, at present estimates, will total about 567,262,000 bushels, about 169,276,000 more than the final crop of last year. Weather conditions were somewhat against the Spring wheat crop, but the July government report estimates it at about two hundred million bushels, eighty million below last year. The corn crop apparently will be some 6 per cent below the last five-year average.

Since the supply of hogs, however, has been a little under normal for the past year, the corn crop will leave a carry-over a little better than normal.

The livestock market has been ample. The year has been a good one for the livestock man. Hogs continue to bring good profits. The number of cattle slaughtered under Federal Inspection during the first half of the year is the second largest on record for the period, and if calves are included in this figure, the number is higher than any previous similar period. In spite of the large number of animals killed, prices have been higher than at any time since 1920.

While in the central west and the Pittsburgh districts, the volume of construction has increased, the total for the country shows a very slight decline.

The textile manufacturers, who have been in more or less trouble during the year, have got together and it is hoped have brought about a situation which will lead to a sounder basis for their industry.

The rail earnings for the first half of the year, recently compiled for the entire country, amount to $494,866,776, which is an increase of over 40 per cent over the figure for 1922. With this figure the number of cars loaded should be given

— this has increased some 25 per cent since 1922.

Insurance sales, which is a good barometer of the financial condition of the average family, is about the same as last year. The figures for the entire country are not uniform, showing very unusual increases (as high as 48 per cent) in some states, and drops (as high as 20 per cent) in others.

Bank checks cashed exceed figures for all previous years by a comfortable margin.

Electric power consumption, which, with the growing use of this form of energy for industrial purposes, is becoming to be considered a very good barometer of industrial activity, is higher than at any previous time, the estimated consumption per capita for this year being 604 kilowatt hours as compared with 570 kilowatt hours for last year.

The United States Department of Labor at Washington compiles each month an index of employment based on payroll data, from thousands of mills and factories. This index shows that there are now 113 persons at work for every 100 who were at work in 1921. In spite of this, however, there are more available jobs at the present time than there were last year.

The John A. Roebling's Sons Company has announced with deepest sorrow the death of their president, Washington A. Roebling, which occurred on Wednesday, July 21, 1926.

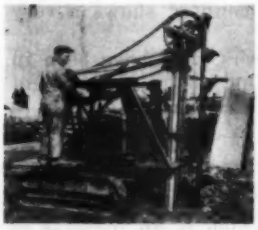
DEVICES YOU OUGHT TO KNOW ABOUT

Barber-Greene Ditcher Model 44-B

The *Barber-Greene Company* was organized in 1916 to manufacture portable belt conveyors. Shortly after the founding of the Company,

A Barber-Greene Model 44-B Ditcher at Work

Barber-Greene Self-Feeding Bucket Loaders were put on the market. From this bucket loader the Barber-Greene Company's first ditcher was evolved in 1920, and put on the market after several seasons of experimental work in 1923.



One of the Experimental Barber-Greene Machines Built in 1926.

Barber-Greene's first ditcher to be placed on the market, Model 44, has been followed with two other models, 44-A introduced in 1924 and 44-B introduced this year. Today the machine is driven with a 41 horse power motor instead of their earlier motor of 28 horse power.

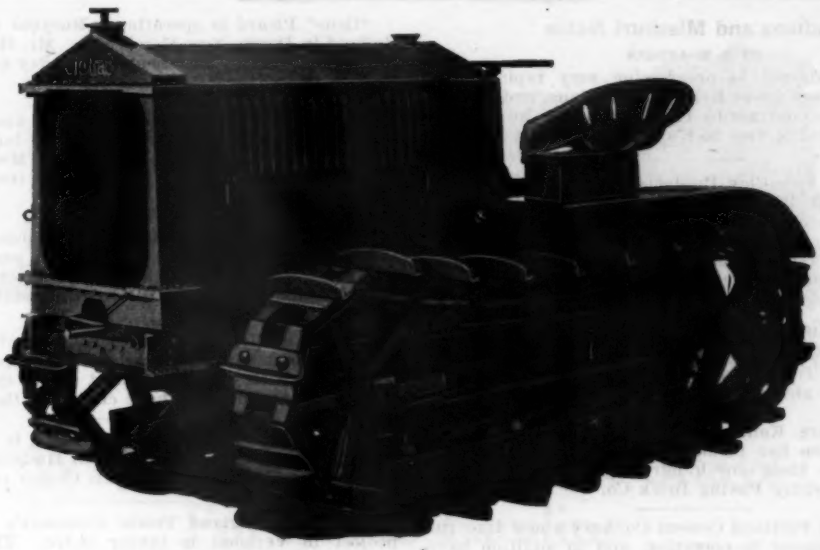
Combination Welder and Air Compressor

A combination air compressor and arc welder driven by a gas engine and mounted on a single base has been placed on the market by *Schramm, Inc., West Chester, Pennsylvania.* The outfit consists of a Buda gasoline engine, a Schramm compressor and a General Electric welding outfit. The complete equipment may be mounted on a standard two-ton truck or can be made portable by adding steel or rubber-tired wheels.

The Buda engine is a 24 horse power, 800 r.p.m. unit which may be started by operating independently of either the compressor or welding generator. The Schramm compressor is a two-cylinder, water-cooled machine with a capacity of 120 cubic feet per minute and equipped with an automatic unloading device. The air receiver is 16 inches in diameter by 42 inches high. The General Electric welding equipment consists of a belt-driven WD-12 arc welder with an idler pulley for belt tightening. By the use of a Borg & Beck 12-inch clutch coupling, either of the machines may be connected to the engine.

It is expected that this outfit will be of great value in field work.

Detroit has been made famous by the automobile, Grand Rapids by furniture, Milwaukee, in days now passed, by beer, but it remains for the town of Trossingers, Wurttemberg, to be carried to fame by the lowly mouth organ. Last year its factories provided the world with 51,000,000 heretofore unblown instruments.



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SHOTS FROM THE · FIRING LINE ·

Indiana and Missouri Notes

BY B. R. ANDRES

George Pontarelli is progressing very rapidly now with his big sewer job at Evansville, Indiana, and expects to complete the contract by fall. On the job he is using two Bucyrus 50-B's, two 30-B's, one 20-B and a Buckeye trench digger.

The Walsh Fire Clay Products Co. of St. Louis have their new 50-B Bucyrus installed at their Jonesburg, Missouri, mine and report it to be a wonderful digger.

C. I. Jones reports that his road job at High Ridge, Missouri, is coming along fine now. A Bucyrus 30-B Diesel shovel is doing the grading.

Missouri and Kansas Notes

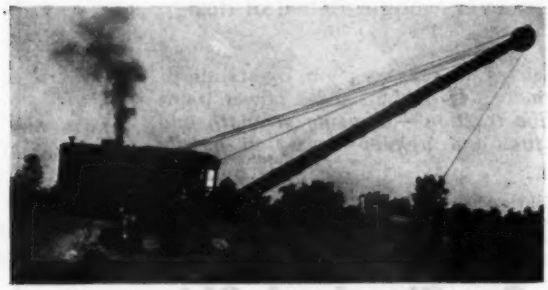
BY A. M. SHEFFER

Tibbetts & Tibbetts, Kansas City, Missouri, contractors, are going nicely with their several contracts.

The Pittsburg, Kansas, plant of the United Clay Products Corporation has resumed operations and will give employment to about one hundred men. This was formerly the Pittsburg Paving Brick Co.

The Kansas Portland Cement Co. have a new Bucyrus 50-B electric shovel in operation, and in addition have installed two new Vulcan eight-ton gasoline 36-inch gauge dinkey locomotives and fifteen four-yard cars. This company is making great improvements in their plant near Bonner Springs, Kansas, as well as beautifying the appearance with new walks, grass, etc.

A new company has been organized and will shortly be stripping and loading coal near Pittsburg, Kansas. The new concern will be styled Walker Coal Company with headquarters at Pittsburg. Mr. Wm. Walker is president.



C. E. Winters is operating a Bucyrus 30-B Diesel for Tibbetts and Tibbetts on a new Federal Aid project in Cherokee County, Kansas. This new job will involve about 6½ miles of ditch and some 80,000 cubic yards of earth and rock.

New England States

BY JOHN J. O'CONNOR

The Lane Company of Meriden, Connecticut, report a very busy season, the crushed stone division being especially busy.

Powers Bros., Brockton, are reconstructing a three-mile stretch of road in Amesbury, Massachusetts. This is another link in the inland route from New York City to the Maine resorts.

"Gene" Picard is operating a Bucyrus 31-B for P. J. Holland in Derry, New Hampshire. Mr. Holland reports laying 1400 feet of pavement in one day recently. This is also a record for Massachusetts.

Jack Mason did not object to his assignment with the Great Northern Paper Company. Jack is erecting a Bucyrus 20-B Diesel on the shores of Moosehead Lake, Maine, where it is said the bass and trout are so big he uses a ⅞-inch cable for a line.

The covered reservoir to be built in conjunction with Providence, Rhode Island, new water supply has been let to A. Phelps of Knoxville, Iowa. The Cenedella Construction Company of Milford, Massachusetts, were second bidders.

Definite steps toward the beginning of work on the sixty-million-dollar additional water supply for Boston were made with the appointment of the special commission by the Governor to have charge of this project.

P. Cogger of Lowell, Massachusetts, is doing a grading job for the Sister's Convent in Hudson, New Hampshire. Other than this work Mr. Cogger reports a quiet season.

The New England Power Company's hydro-electric project in Vermont is taking shape. Their two new Osgoods are located there.

The New England Power Company and Line Co.'s plant at Thomastown, Maine, is about ready to start production. A capacity of 1,500,000 barrels yearly is anticipated.

New York State Notes

BY T. A. BURNS

We hope that by the time the next issue of *The Excavating Engineer* goes to press the 53rd Street tunnel will have been let. One subway contractor working on Eighth Avenue somewhere between Bank Street and Central Park West is way beyond that even — he says he will be doing that job in the middle of September. However, we know of a dark horse in Philadelphia.

To the Editor, Excavating Engineer.

Dear Ed.:

The following is an open letter respectfully requested published in your valuable paper to explain our position to two fine fellows:

Mr. F. J. Cloud and S. O. Bouersfeld,

Gents:

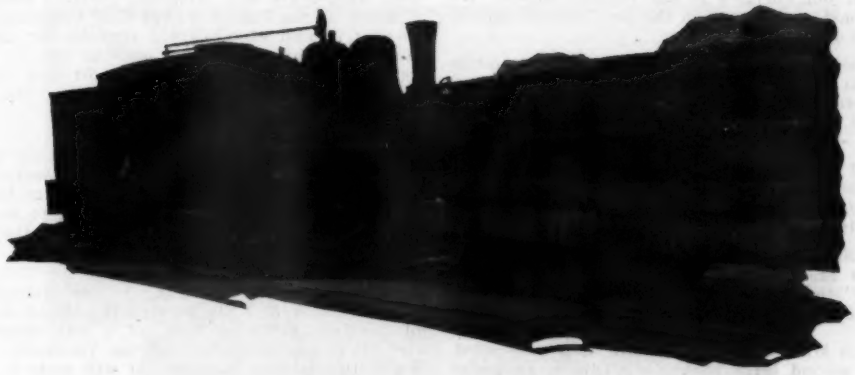
After all, we do not believe that it was the roadbed of The Atlantic Coast Line that was entirely to blame. If that Pullman porter from South Carolina hadn't set the bag too close to the steps or, better still, if he had held it in his arms, both arms, as we cautioned him to do, the misunderstanding would not have arisen.

Then, to make matters worse, when we came back here the boss was out of it, or out with it, anyway his locker wasn't locked and it wasn't worth while looking. Then, that place on Greenwich Street had run out of shoe boxes.

We were in Canada all right, there's no reason why we should tell a lie about it, but the Missus was with us, and what is an ordinary customs inspector compared to the Missus with the eye she has?

Your only hope, and mine, is to vote for Al Smith and Senator Wadsworth.

Very truly yours,



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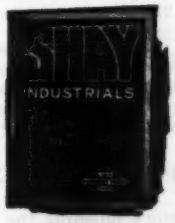
3. On rough, crooked track and steep grades, — where rod engines are helpless — Shays operate successfully;
4. Their multi-cylinder engine gives Shays a strong, uniform pull, like an electric motor;
5. Their low wheel loads and absence of driving wheel counterbalance enables Shays to operate on light-weight rail, over earth roadbeds.



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SHOTS FROM THE FIRING LINE — Cont.

Well, Joe Kovath now has a job which suits him, and we can divert our energies to our regular duties. We have spent considerable time in the past several months fitting jobs to Joe.

P. F. McDevit advises that John Chrisholm, formerly superintendent for George M. Brewster of Bogota, New Jersey, has started in business for himself in Hackensack. We all join in wishing Mr. Chrisholm every success.

You would never know Dave Cannavan. He has lost eighteen pounds in five months, has an exceptionally large bonus coming and has an unimpaired palate. My, what possibilities!

Mr. John Sprague of the Sprague Construction Company told us that he would do certain things if he "pulled down" the Nassau County Parkway job. Well, John, you've done it — now will you?

Anthony La Mura and John Stradta, now associated, are on their second large rock job. This is an entire block at the corner of Broadway and Dykeman Street. There are two other good sized excavating jobs in this vicinity, and a comparison of the methods used and results obtained on the three jobs would be enlightening.

Pacific Coast Notes

BY P. H. BIRCKHEAD

Contract awarded to United Dredging Co., 325 Central Building, Los Angeles, who bid $0.42 per cubic yard for dredging at San Diego Harbor, work involving 336,400 cubic yards dredging.

Final surveys of the new 22-mile road up Mount Graham have been started by engineers from the United States Bureau of Public Roads office at Phoenix. As soon as these surveys are completed bids will be called for on the first section of the highway, eleven miles, it is stated.

Contract awarded to Marsh Bros. & Gardenier, Monadnock Building, San Francisco, for 12 miles railroad middle fork extension of main line for Pickering Lumber Co. near Sonora, Tuolumne County, work involving approximately 400,000 cubic yards excavation.

Contract awarded to the Utah Construction Co., Ogden, Utah, and Phelan Building, San Francisco, for the construction of portion of main line from Granite to Riverside, Colorado, for the Denver & Rio Grande Western Railroad, Denver, Colorado. Address of the Denver & Rio Grande Western Railroad is Equitable Building, Denver, Colorado.

The laying of rails for the new $15,000,000 Southern Pacific main line railroad through Phoenix has now been completed. There remains considerable work yet to be done, including ballasting and completion of bridges.

Contract awarded to Sharp & Fellows, Central Building, Los Angeles, for the construction of railroad for the Santa Fe Railroad Co. from Fulton to Sands, New Mexico.

The Santa Fe Railway Company has awarded a contract to Sharp & Fellows, Los Angeles, for the lengthening of one of the tracks in the local yards to 4,000 feet. The contractors now have a steam shovel at work on the job. The railway company plans on spending $100,000 on improvements at the local yards, $68,000 of which will go for new buildings for the mechanical department.

Pennsylvania Notes

BY T. H. BARRETT

Rhoads Contracting Co., Ashland, Pennsylvania, has been awarded a new stripping contract near the Sayre Colliery by the Lehigh Valley Coal Company. They are moving in and expect a big yardage for the month of August. They report that on one day in July three railroad-type shovels, a Marion 70 and two Bucyrus 70-C's, made the same production, that is, 268 4-yard cars, all on different jobs.

A "machine service recorder" has been installed on the Bucyrus 320-B electric of the Cranberry Creek Coal Co. and the daily performance charts are being studied with great interest. It is interesting to note that the 2⅛-inch hoist cable was changed during the night shift in less than two hours.

When the work of filling in the stripping between Beaver Brook and Slackerville is completed, the tracks of the Lehigh Valley Railroad, a mile distant between the Yorktown substation and the Yorktown Lehigh Valley station will be changed. It will make a more direct line and will eliminate two dangerous curves. The steam shovel formerly in operation at the No. 9 stripping has been moved to the slate banks near the C. M. Dodson Colliery, where work will be started at night to load up the debris to be dumped into the stripping.

Delaware, Lackawanna & Western Railroad Co. is completing the storage of anthracite coal at the storage plant in the lower end of Wyoming borough. Approximately 250,000 tons of coal are being stored in six huge piles. Steel "trimmers" are used to hoist the coal and dump it in the proper place. Two of the "trimmers" are now being used in making the piles, which will contain approximately 35,000 tons of coal.

The Scranton Coal Company has announced its decision to spend a million dollars on improvements on its workings here. The plans call for the building of a tunnel whereby the output of three mines will be taken underground to one breaker and there prepared for market.

Philadelphia and Vicinity

BY H. C. DAVIS

James Porter is at work finishing the excavation for the City Hall Annex at the corner of Juniper and Filbert Streets. The total amount of material moved is about 16,000 cubic yards. Jim Nash is foreman on this job. Charles Kennan is running a Thew shovel and Mike McCullough is firing it.

Charles Finn of 6118 Pine Street is doing the grading work and cutting streets on a real estate development at Frankford and Coltman Streets. On this job he has three P. & H. shovels and one Thew gas shovel. Wm. Maley, D. Friend and Mr. Trail are running the P. & H. shovels and James Maley the Thew. G. L. Effings is the superintendent and H. Lochner the assistant.

Gudnech & Cullison of Tacony, Pennsylvania, have a new Marion at work at Cottman and Jackson Streets finishing up an 8000-yard excavation. This work is being done for new residences.

Fred T. Benkins, 4050 Kensington Avenue, Philadelphia, has about 800 feet completed on an 1800-foot sewer job near Tulip and Bridge Streets, Philadelphia. This sewer is 25 feet deep and a foot wide, outside measurements. Sam Salfe is foreman on this job and Joe Condi and Frank Cozzo are the engineers.

Faster Haulage—Lower Costs

Whitcomb Locomotives with their more tham ample horse power per ton, assure rapid haulage at low cost.

Instances of haulage at less than ½ cent per ton are not uncommon and when you consider the fact that maintenance is a negligible item and that a licensed operating crew is not necessary, it is easy to see how "Whitcombs" will fit into your haulage program.

For contract haulage, or switching cars at storage points, "Whitcombs" are ideal. They are made in all sizes and gauges and may be had powered by either gasoline engines, electric storage batteries, or fitted with a trolley.

Our Engineering Department is thoroughly conversant with all types of haulage problems and will be glad to help you select the proper type of locomotive for your work.

GEO. D. WHITCOMB COMPANY
ROCHELLE, ILLINOIS
Offices in principal cities

GASOLINE – STORAGE BATTERY – ELECTRIC
WHITCOMB
LOCOMOTIVES

In writing to George D. Whitcomb Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Cont.

The Philadelphia & Reading Railway are building a new Y. M. C. A. at Reading, Pennsylvania. The grading and excavation work is being done by F. H. Clements of Bethlehem, Pennsylvania.

Work & Company are erecting a new factory for The Watson Company at Tulip & Bridge Streets. This work is under the supervision of Van T. Yoland. The excavation was let to Berckley & Banks, who hired a shovel from R. M. Bennyman of Philadelphia. This shovel is a new Thew and George Thomas is the operator, J. A. Crisey the fireman.

Perna & Mattia Company are about a third through with sewer work at Frankford Avenue and Lansing Street. They are getting along in good shape. Frank Pinciotte is running a Beyers clamshell for them.

C. S. Seabrook of Bridgeton, New Jersey, have about 30,000 yards left on a contract which was originally about 250,000 cubic yards. At present three shovels are at work. W. W. Martin is the master mechanic and in charge of the shovels. The runners are James Cook, W. H. Leo, M. T. Farrell. The foremen are Richard Lee, Peter Shiler and Robert Riley.

The McLean Contracting Company of Baltimore, Maryland, are completing their contract on the Wingohockin sewer. This sewer is 21 feet x 24 feet, inside measurement. A Marion 37 and an Erie crane are being used. D. A. Shields is the superintendent, Mike Fanin is running the Marion, and his brother, George Fanin, is firing. Dan Terry is on the Erie.

Mayzola & Morano are at work on the Wingohockin sewer at G. & Romona Streets. They started last winter and will probably not finish for at least 18 months. Robert P. Ryan is superintendent, Charles Sylvester is foreman, and Frank Verntraca and Elmer Anderson are running two Northwest cranes.

The Patrick MacGovery Contracting & Engineering Company are on the last piece of work on their Broad Street Subway contract. Most of the Bucyrus 20-B air shovels and the three Bucyrus 50-B shovels are running two ten-hour shifts. The crews are as follows:

20-B Air, Day Shift: Bill Cody, Bob Lindsey, Mike Morrisey, Frank Sweet, Joe Flight, Roy Zook, Al Shortell and Dick White.

Night Shift: James MacDonald, John Horn, Matt Gardner, Edward Manner and Lewis Manner.

50-B Steam, Day Shift: Charlie Ban, runner, Joe Kelley, fireman, Jeny O'Neil, rope-puller, Andrew Armstrong, runner, Jim Doyle, fireman, John Shortell, rope-puller.

Night Shift: John McGuckin, runner, Gordon Letham, fireman, George Newgraves, rope-puller.

One of the Bucyrus 50-B machines is run by air. This machine is used to place steel in the structural work. Jim Medely is running this machine on the day shift and Ross Parker on the night shift.

Our old friend Bill Murray is still on the job.

Mazzula & Morano have about 1 mile of paving to put in on Germantown Avenue, Chestnut Hill, Philadelphia. W. N. Swan is in charge; Harry Meiz is the inspector.

The End of All Friction Troubles

ASBESGRAPHITE

Are you putting a new set of friction blocks on the drum of your shovel every three or four weeks and causing yourself a lot of grief? Or — are you using *Asbesgraphite Moulded Brake and Friction Blocks?*

Asbesgraphite Friction Blocks will wear for years. We mould them in any size or shape with bolt holes in place to fit any friction, clutch or brake and our job is finished. Your job is to put them on and forget your friction troubles from then on and henceforth.

If your frictions slip, if they grab and jerk, if they contract and expand with changing temperatures, or if you are having other troubles, install *Asbesgraphite* and your difficulties are ended.

Prevent wear and tear to your machinery and loss of time to your equipment by using a friction product that holds with just a light contact and operates constantly with a soft, cushion-like effect.

We manufacture folded and compressed asbestos brake lining and carry a stock of all sizes for urgent requirements.

ASK US

THOMAS L. GATKE
Manufacturer
Railway Exchange Bldg.
CHICAGO, ILLINOIS

In writing to Thomas L. Gatke please use post card bound in the center of this number.

The 2-Range Transmission—an *exclusive GMC feature*—develops 30% more pulling power than is possible with the same size engine and the usual type of transmission. It also effects great fuel savings by allowing all work to be done with the engine operating at its highest efficiency. And this is only one of the reasons for Big Brute's greater Power—Endurance—and Economy.

GMC Big Brute

Promised much—It is delivering more

A few months ago when General Motors announced the arrival of Big Brute as a "*truck such as men had never seen before*" the industrial and commercial world was amazed. Never before had any truck manufacturer dared to make the promises which were made for Big Brute.

Yet, all over the country and in every line of business, Big Brute is not only delivering all that is promised—**but more.**

Letters by hundreds tell amazing stories of its ability, and say, without any qualification, that Big Brute *is* a truck with which no other can compare and is performing in a manner no other truck ever approached.

Yet this is not surprising. For Big Brute is the result of 24 years successful truck building, plus all the great engineering and manufacturing facilities of General Motors. It is, in fact, the culmination of everything learned since motor trucks were first built. And so it is only natural that it should actually be a truck without "bugs"—**a truck endowed with incomparable power, endurance and economy.**

See Big Brute today. Test it on the steepest hills and in the hardest pulling. Notice how eagerly it responds to a touch of the throttle. Put it up against the hardest jobs you know. Expect **more** of it. **You will not be disappointed.**

Sold and Serviced Everywhere by Branches, Distributors and Dealers of

GENERAL MOTORS TRUCK COMPANY, Pontiac, Michigan

A DIVISION OF YELLOW TRUCK AND COACH MANUFACTURING COMPANY

GMC 1, 1½ and 2½ ton trucks — GMC Big Brute 3½ and 5 ton trucks — GMC Big Brute 4 to 15 ton Tractor Trucks
Co GMT Co—1926
Yellow Cabs — Yellow Coaches — Yellow Light Delivery Trucks — Hertz Drivurself Cars

In writing to General Motors Truck Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Cont.

John J. Lynch of 1006 60th Street, Philadelphia, has a Thew at 41st and Chestnut Streets. Pete Burke is pulling the levers and Ed. Pierce is firing. John J. Jr. is on the job and is a live wire. He takes charge of the work when his father is away. There is about 5,000 yards of dirt to be moved. This excavation is for the basement of an apartment house to be erected.

The Municipal Paving, 702 Chaterine Streets, are going along in good shape on their paving job, at Richmond Street, between Lehigh and Boyth Streets. Glen Evans is running a Beyer's skinner. Glen at one time ran a Bucyrus 20-B air for McGovern and has a good word to say for them. R. Di Lenno, head of this company, is taking charge of the job.

Pittsburgh and Vicinity

BY FRANK R. SMITH

R. H. Cunningham & Sons Company received a contract for road work at Zelienople. Bob has a Bucyrus 30-B steam and two Bucyrus 20-B Diesels on this work. Mr. Cunningham just recently purchased one of the new Bucyrus 41-B's which will also be used on road work.

John F. Casey Company have finished work on the Canton Cut-off and they now have their Bucyrus 50-B in the Pittsburgh district.

Central Silica Company at Zanesville have their new Bucyrus 31-B in the quarry. Mr. Croskey, general superintendent, has charge of all mines, and Mr. Ayers of the Ayers Mineral Company is president of the Central Silica.

Charley Flynn is stripping coal with his Bucyrus 80-B in the Cadiz district and is making the dirt fly.

Vic Blakeslee of the Beck, Riley & Hall Equipment Company visited our new office the other day. It is rumored that Vic took unto himself a wife — you will have to have a raise, Vic.

R. M. Netherland Company have their new Bucyrus 30-B working in the Pittsburgh district on basement excavation work.

Great Lakes Portland Cement Company at Buffalo recently purchased a Bucyrus 50-B electric for their quarry operation.

Frank Meirs, shovel runner, stopped in to see us the other day. He is looking for a job on one of the large revolving shovels.

Mr. Martin of the R. H. Cunningham & Sons Company visited our office the other day.

Southern States Notes

BY W. W. WHORLEY

J. D. Morris is handling a Bucyrus 20-B for J. W. Gwin at Everett, Glynn County, Georgia.

Wyatt Farr is loading granite for the Holston Quarries Company at Beverly, South Carolina, with a Bucyrus 60-C. F. L. Murphy is craning while Ernest Holder keeps things hot.

The Tidewater Construction Company of Key West, Florida, is operating their Bucyrus 50-B Diesel on the Key West Boulevard, which connects with the Overseas Highway.

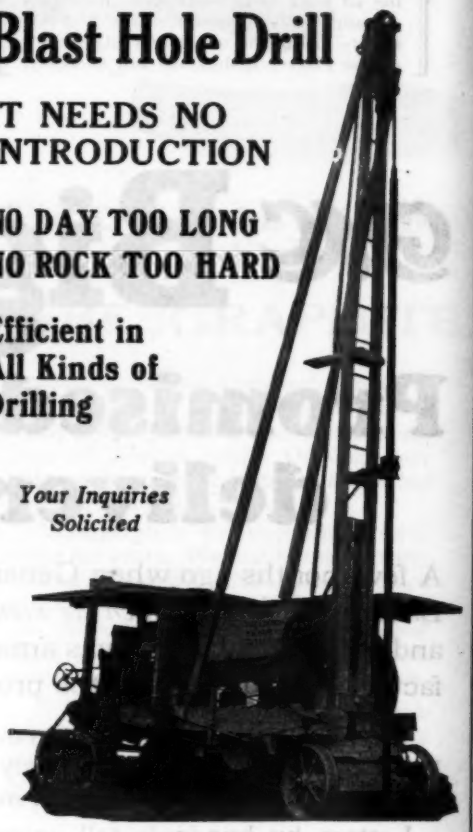
The "CLIPPER" Blast Hole Drill

IT NEEDS NO INTRODUCTION

NO DAY TOO LONG
NO ROCK TOO HARD

Efficient in All Kinds of Drilling

Your Inquiries Solicited



First. This "Clipper" late improved drill is simple. There is no intricate and troublesome machinery to get out of order and run up maintenance costs.

Second. It is durable. Built to stand the heaviest work and the roughest handling. Sturdiness and ruggedness is built into every part.

Third. It is easily maintained. No need for constant attention and unending "tinkering."

Fourth. It is faultless. Each part is proportionately as strong as the next. This means absence of breakdowns due to weak spots.

Steam, electric, gasoline or air drive. A Drill that will fit every circumstance and job.

Predomination, because it has stood the test and is approved by critics. It commands your investigation.

The Loomis Machine Company

(*Established 1842*)

K Street, Tiffin, Ohio

MAKERS OF POWDERS SINCE 1802

A power plant of 1802 when the first du Pont powder mill was built

Counsel—

There is a more efficient way to do everything. This is particularly the case regarding the selection and use of explosives involving a definite outlay of money, energy and preparation.

Du Pont Technical Field Service offers to explosives users the co-operation of men skilled in the selection and application of explosives power to blasting problems. This counsel or assistance is predicated upon the extensive knowledge acquired by du Pont during 123 years of experience in manufacture.

E. I. DU PONT DE NEMOURS & CO.
INCORPORATED
Explosives Department
WILMINGTON, DELAWARE

DU PONT

Explosives power is extensively employed for construction of the gigantic hydro-electric plants of modern times

123 YEARS OF LEADERSHIP IN THE SERVICE OF INDUSTRY

In writing to E. I. Du Pont de Nemours & Co., Inc. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Cont.

C. G. Kershaw Contracting Company has placed their Bucyrus 30-B Diesel dragline on their contract for the Belle Glade extension of the Okeechobee Branch of the Florida East Coast Railway. Mr. Roscoe Kershaw is superintendent in charge at Canal Point. J. G. Whisenant, who has been in the Kentucky coal fields, is handling the Bucyrus 30-B. James Parkhill is oiler.

Harry Ellerkamp is building a section of the West Dixie Highway through Broward County. A Bucyrus 20-B Diesel dragline is handling the grading.

F. A. McKenzie of Lakeland, Florida, is widening the Palm Beach Canal for the state of Florida. On this work he is using two Bucyrus 30-B's and one Bucyrus 50-B Diesel draglines. These machines are operated three shifts and have moved as high as 140,000 yards in one month.

The National Construction Company has completed a road contract at Jensen and has moved their Bucyrus 30-B Diesel dragline to their terminal railway contract in Jacksonville, Florida.

The Board of County Commissioners of Broward County have received their third Bucyrus 20-B Diesel dragline and are operating it on a highway from Davie to Okeechobee.

J. B. Turner of Columbiana, Alabama, has landed another nice road project, ten miles long between Clayton and Union Springs in Barbour County.

Will Pattie of Birmingham landed a nice paving job in Russellville, Alabama.

Newell Contracting Company, who are well known as road builders in Alabama, and other southern states landed 18 miles of roadway between Monroeville and Bellville in Monroe and Conecuh Counties.

Nixon & Phillips were awarded ten miles in Wilcox County between Camden and Rosebud.

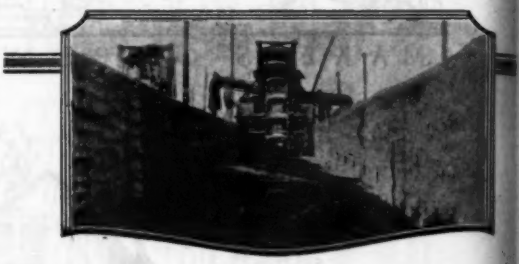
J. T. Moses, who has been stripping coal in the mountains of Tennessee, was a recent caller at this office.

Joe Davis is loading brown ore with Bucyrus 45-B shovel No. 302 near Cedartown, Georgia. This shovel is an old-timer with armstrong swing, but Joe declares that it still gets a dipper full.

The many friends of J. D. Donahoo, the well-known railroad contractor of Jacksonville, will be glad to learn that he is up and going once more after an operation for appendicitis at St. Luke's Hospital.

W. C. Shepherd, prominent general grading and road-building contractor of Atlanta, Georgia, is at work on a contract with the city of Inverness, Florida, which calls for 50,000 cubic yards of excavation, 75,000 lineal feet of curb and gutter, 6,000 lineal feet of curb, 98,000 square yards of six-inch base surface treatment. The total amount of the contract is $233,500. Mr. Shepherd, who recently completed two subdivisions in the city of Atlanta, Haynes Manor and Blue Rock Heights, also has working at the present time a shovel in Atlanta and two shovels in North Carolina.

Every Buckeye Has *Greater* Digging Range



The Rotary Auxiliary Cutter enables every Buckeye to dig many widths of trench. Therefore, any Buckeye can do the work of several ordinary excavators.

Great range of cutting widths, a wonderful advantage, is only one of the many superior working features of Buckeye Trench Excavators.

There is no "weak link" in Buckeye construction. From power plant to digging chains, Buckeyes are designed and built to give steady, profitable service in all kinds of digging.

The heavy-duty engine develops plenty of power — it always has some in reserve.

The power is profitably used — gears and chains transmit it. No loss due to slippage. Automatic safety device protects against overloads.

Then there's the Quick Shift Conveyor — the greatest individual improvement on modern trenching machines. It was originally developed and perfected on Buckeyes.

Driven from both ends, this Conveyor has an exceptionally wide belt, which is kept centered by a patented construction. No material too wet, too slippery or too difficult to handle with this Buckeye invention.

Thirty years' successful experience guarantees Buckeye performance.

Ask any owner — or write us for the evidence.

The Buckeye Traction Ditcher Co.

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types), Pipe-Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers.

Findlay, Ohio

There's a Buckeye Sales and Service Office Near You

BUILDERS OF TRENCH EXCAVATORS FOR OVER 30 YEARS

Fifteen years old and still going strong, handling Bethany Falls Limestone at Independence, Mo. These WESTERN Dump Cars have stood this pounding for 15 years. The new cars of today will take even more punishment.

Performance Tells the Story

THE surest guide in the search for the most efficient equipment will be—as always—the record of past performance.

The name "WESTERN" is 49 years old and the past performance of equipment bearing that name "tells the story." Your own records or the experience of others are available. We should like to tell you why others have standardized on WESTERN cars and why WESTERNS are the predominant cars in nearly every field today.

Western

That's Why!

Available in sizes of 1½ yards to 30 cubic yards capacity.

Western Wheeled Scraper Company

Founded 1877

Earth and Stone Handling Equipment

Aurora, Illinois

SHOTS FROM THE FIRING LINE — Cont.

J. W. Bell writes from Indian Pass, Florida, that he is operating a Bucyrus 20-B at that place on highway work for the State of Florida. He is operating close to the beach on Apalachicola Bay and would like to hear from any of the old timers.

We have a letter from P. F. Burke at Acmar, Alabama. He writes that he is pulling the levers on an Osgood 73 for MacDougald Construction Company. Uncle Sam will reach him at Box 194, Acmar, Alabama.

St. Louis Items

BY A. B. KOENIG

The Industrial Track Construction Co. are finishing their Wabash Railroad grading at Adrian, Michigan, and will begin laying steel immediately.

J. R. Swigart moved his shovel outfit from Farina, Illinois, to Montpelier, Ohio, on the Wabash Railroad.

John Marsch made several flying trips to St. Louis since the last issue. He reports good progress with his work on Illinois Central and Mobile & Ohio Railroads in Southern Illinois.

The contract for graveling the road from Bardwell, Kentucky, south to the Hickman County line was awarded to Taylor, Petrie & Co. of Lewisport, Kentucky, the price being $57,592.80. The contract includes the surfacing of 6.820 miles and the material to be used is bank gravel.

Martin E. Leffler, Benton, Illinois, was awarded contract for grading on Route 14, Section 12X, White County, Illinois.

McEachin & McEachin of Little Rock were awarded the contract for construction of water and sewerage systems in Atkins, Arkansas. Their bid was $102,000. The water supply will be obtained from a well two miles south of town, which recently has been tested for quantity and quality.

J. S. Samples, assistant chief engineer Missouri Pacific Railroad, was married to a Kirkwood, Missouri, young lady. Samples has been busy acknowledging receipt of congratulations from his numerous friends.

W. A. Gierke moved his team outfit to Jewett, Illinois, on a piece of A. Guthrie & Co.'s work. He has a few teams idle at Dana, Illinois.

Commissioners of Bentonville, Arkansas, Paving District No. 1, awarded the contract for paving to E. H. Locher of Okmulgee on a bid of approximately $69,000 for seven-inch plain concrete to be completed within 90 days. Locher is engaged now in paving work at Siloam Springs.

C. C. Fairolo, Champaign, Illinois, secured contract for a bridge on Route 26, Ogle County, Illinois.

H. R. Cawood, Mt. Vernon, Illinois, whose hobby is masonry and concrete, was with us a day. Cawood has an outfit at work on John Marsch's work in Southern Illinois.

H. E. Scott of the Industrial Track Construction Co. left here with a crew of foremen and laborers to begin laying track on the addition to the Wabash Railroad yards at Adrian, Michigan.

BOILERS

Operating a year or more at peak capacity, three eight-hour shifts per day, seven days per week, with varying fuel and bad water, sounds like strenuous service and

YET

It is not at all an unusual situation for steam shovel boilers,

BUT

It is a service where nothing less than the very best will do.

Is the builder of your excavating machinery equipping it with Johnston boilers?

JOHNSTON BROS., Inc.

Specializing in Boilers for Contractors' Equipment

FERRYSBURG, MICHIGAN

In writing to Johnston Bros., Inc. please use post card bound in the center of this number.

Sundown is no time to quit

When unforeseen conditions hinder the progress of your jobs, when bad weather and breakdowns bring completion dates dangerously near, get yourself a KOHLER Automatic Electric Plant and light up for night work.

This sturdy, dependable electric plant can readily be mounted on your equipment, for it is compact.

It supplies enough current to floodlight extensive night operations, and to run portable electric power tools. It can be used to light up the camp, cook house, supply sheds, and stables.

KOHLER Automatic Electric Plants have been installed on many ditchers, draglines, pavers, shovels and other excavating and construction equipment. They repay their cost many times over by increasing the production per unit, which night work makes possible, by reducing overhead expenses, and by enabling their users to complete contracts on time.

Send us your name and address for complete information and prices.

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OF
KOHLER

Kohler Co., Kohler, Wis.,
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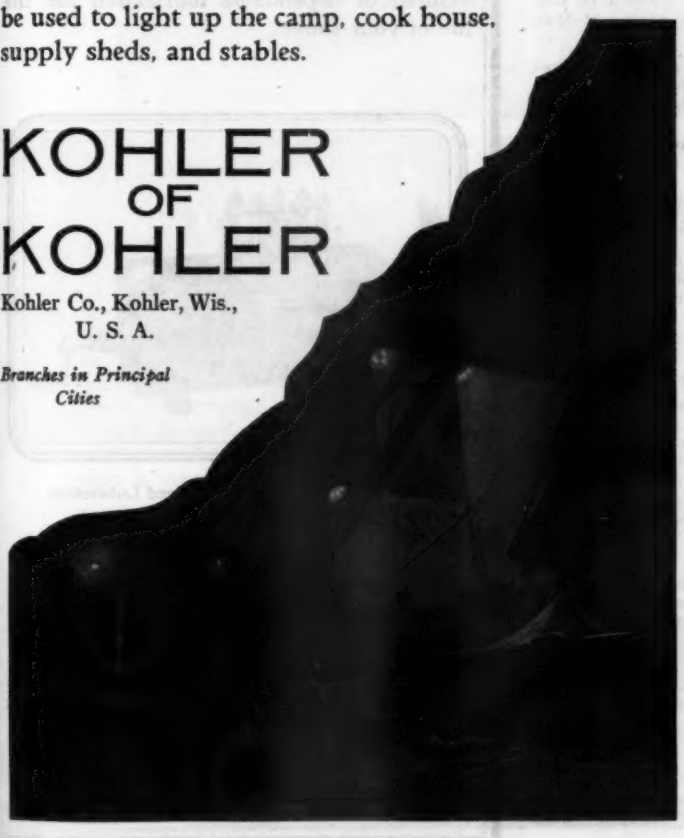
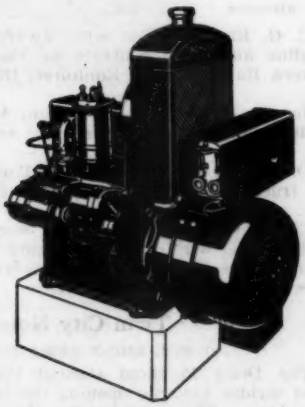
Branches in Principal Cities





Kohler Automatic Electric Plants

Model "D"—110 Volts—1500 Watts

4-cylinder, water-cooled engine.
Pressure lubrication to main bearings and rocker arms.
Crank shaft, cam shaft, connecting rods and rocker arms—drop forged, special steel, heat treated for strength and hardness.
High tension magneto ignition.
Generator—4 pole, compound wound.
Measurements—Exclusive of starting battery, length 35 inches; width 16½ inches; height 35¾ inches.
Built also in 800-watt and 2000-watt capacities.

In writing to Kohler Company please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Cont.

Wm. Welch is working at Adrian, Michigan, on Wabash Railroad work under the Industrial Track Construction Co.

W. J. "Bill" Rohan, local manager of Winston Bros. Co., is spending a few days in North Carolina.

J. W. Etchison Co. of Casey, Illinois, were awarded 8.9 miles of slab, Section 6, Route 24, Illinois hard road.

J. J. McCaughey Co., Chicago, were awarded contract for 3.74 miles of grading on Route 24, between Rochester and Springfield, Illinois.

W. C. Johnson of Belleville, Illinois, will build two bridges, between Rochester and Springfield, Illinois, over the south fork of Sangamon River.

Tegge-Honig Paving Co. of Papineau, Illinois, were awarded contract for paving through Vandalia, Illinois, on Route 11, State Highway.

J. W. McMurry Contracting Co. were awarded contracts by the Wabash Railroad Co. for a concrete bridge over creek near Edwardsville, also subways at Barry, Illinois, and Chillicothe, Missouri. Mr. McMurry and wife are taking a vacation in Colorado. Floyd O. Gibbons is taking care of the different jobs during McMurry's absence.

C. G. Blythe & Son were awarded a steam shovel, dragline and team contract by the Chicago & Northwestern Railroad near Elmhurst, Illinois.

Joe D. Roach, No. 78, Hokah, Minnesota, reports a machine outfit idle ready to move on to a job.

D. A. McLaughlin, a good all-around steam shovel and track superintendent, is idle at De Witt, Missouri.

Contractors when in want of work or labor for their outfits write, wire or phone Koenig Labor Agencies, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Twin City Notes

BY H. C. EMERY AND J. C. YETTER

The Dewy Portland Cement Company are making rapid strides towards opening the new plant at Davenport, Iowa. The stripping for the quarry has been let to contract to Ziegler Brothers of Junction City, Kansas. The yardage is estimated at 70,000, and the work will be done with an elevating grader outfit and truck. Mr. Sam Ziegler will have direct supervision of the work.

F. L. Busche has his Bucyrus 20-B gas shovel busy grading streets in preparation of a paving job for which John Kerns has the contract. Culley at the levers of Busche's machine is the all-star performer when it comes to establishing a grade with a shovel.

The Minnesota Highway Department are asking for bids on fifteen miles of paving. Bids to be in August 24th.

Nolan Bros., Minneapolis, were low bidders on the Minneapolis, Northfield and Southern work that was recently advertised.

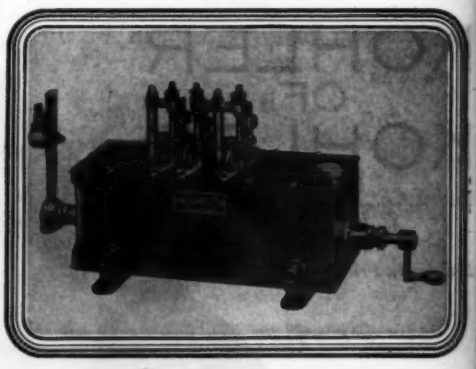
Wilson Bros., Minneapolis, Minnesota, are doing some drainage work in North Carolina.

A McCord Force Feed Lubricator Will Keep Your Shovel on the Job

A McCord force feed lubricator installed on your steam shovel now will insure more continuous operation. Dependable force feed lubrication prevents shutdowns and delays, it gives more hours on the job.

McCord force feed lubricators are used as standard equipment by the largest and best-known steam shovel builders and they will be installed on any shovel at your request.

Put a McCord lubricator on now and be assured of dependable lubrication for the life of your shovel.



McCord Class B. A. Force Feed Lubricator

McCord Radiator & Mfg. Co.
Detroit, Michigan

McCord
force feed
Lubricators

Large capacity F-M Centrifugal Pump direct driven by a 200-horsepower F-M Oil Engine, Merodosa Drainage District, Illinois.

Another drainage district installs F-M pumping equipment

On the Merodosa Drainage District near Albany, Illinois, as on many other drainage projects, F-M pumping equipment has proved its case. The F-M Diesel Engine, burning low grade fuel oils, provides extremely cheap power that is thoroughly dependable. Moreover, operating costs are incurred *only* when the engine is running.

By installing complete F-M equipment this district has secured fully satisfactory pumping service, covered by the definite Fairbanks-Morse cost and efficiency guaranties.

FAIRBANKS, MORSE & CO., Chicago

Manufacturers of Oil Engines, Pumps and Electrical Machinery

28 branches in principal cities at your service.

FAIRBANKS-MORSE

Diesel Engines F M **Pumps - Motors**

1648

SHOTS FROM THE FIRING LINE — Cont.

Roberts Brothers, Peterson Shirley and Gunther have completed the fill for the extension of the Union Pacific ice track in Council Bluffs. The work was completed in record time with a Bucyrus 70-C furnishing the dirt.

S. O. Briggs of the Briggs-Drew-Boyce Company has just returned from a week's outing at the Minnesota Lakes. We did not get to enjoy any of the fish; maybe there weren't any?

The Dubuque Stone Products Company have just installed a 30-inch trailer and a massive Allis-Chalmers sizing screen to enable them to take care of a number of nice crushed stone contracts.

The Hanson Engineering & Construction Company of Buffalo were awarded a nice paving job near Dubuque and will start work at once. The job will be handled by the Kansas City branch of the company.

L. A. Bumgardner & Company, St. Paul, Minnesota, have 20,000 yards of rock excavation near Wilson, Wisconsin.

Nickel & Brumm, Ironwood, Michigan, were recently awarded a grading and paving contract near Marquette, Michigan.

It is understood that the city of Ely, Minnesota, will take bids in August for a combination sewer and waterworks system.

On August 24th the citizens of St. Paul asked to vote on a $1,500,000 bond issue for the proposed Midway sewer system.

It is rumored that Ramsey County will soon call for bids on the Sibley Highway which runs from St. Paul to Shakopee, Minnesota.

On August 31st the Minnesota Highway Department took bids on several large grading projects.

Wisconsin Notes

E. S. Sicnarf writes that he is pulling the levers on a ¾-yard machine in Milwaukee. He would like to hear from any of the old timers. Uncle Sam will deliver his mail at 677 Franklin Place, Milwaukee, Wisconsin.

Canada

Montreal and Vicinity

BY J. M. WARD

The Dominion Construction Company have been awarded contract by the Canadian International Paper Company for the power development at Grand Falls, New Brunswick. This job will run into about one and a half million dollars. They are to make an immediate start.

The Grenville Crushed Rock Company reopened their quarry this year and are running full time, supplying rock ballast for the Canadian Pacific Railroad.

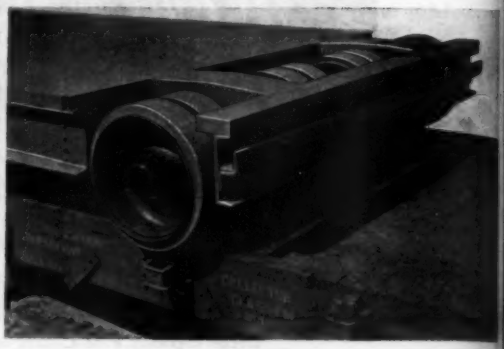
William I. Bishop, Limited, Montreal, are at present engaged on a big pulp mill contract for the Ste. Anne Power and Paper Co. at Beaupre, Province of Quebec, where they are employing about 1000 men.

The Northern Construction Co., Limited, have been awarded preliminary contract for dredging and concrete wharf for the Anglo-Canadian Pulp and Paper Company at Quebec City.

WE Have Two New 25-Ton and 40-Ton

TRAILERS

FOR END LOADING



Rear End Construction

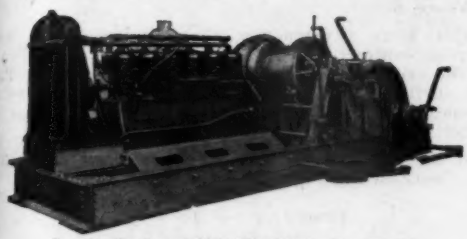
Let us tell you how two men can load a steam shovel, roller or other machine in a half hour.

BUCYRUS COMPANY

SPECIALTY DEPARTMENT

SOUTH MILWAUKEE, WIS., U. S. A.

TWIN CITY ENGINES



Logging Engine made by Washington Iron Works equipped with Twin City Engine.

OTHER Twin City users include: Austin Machinery Corp., Baldwin Locomotive Works, Buckeye Traction Ditcher Co., Bucyrus Co., The Parsons Co., Northwest Engineering Co., Inland Engineering Co., Pennsylvania Pump & Compressor Co., Star Drilling Machine Co., Willamette Iron & Steel Works, etc. Specify Twin City Engines on *your* equipment. Sizes 35 to 140 H. P. Write for literature.

Minneapolis Steel & Machinery Company
Minneapolis, Minn.
Heavy Duty Engine Manufacturers Since 1903

"BUILT TO DO THE WORK"

ONE PRINCIPLE FOR TWENTY YEARS

PITTSBURGH In speaking of Balanced Door Dump Cars, one of the nation's great operators said, "I doubt if a better principle for designing dump cars will ever be discovered." Careful buyers realize the years of underlying development work which have produced different equipments for their consideration. When one of these is based on a better principle than the rest, it is probably more economical to buy.

CLARK CAR COMPANY
BALANCED DOOR DUMP CARS
PITTSBURGH, PA.

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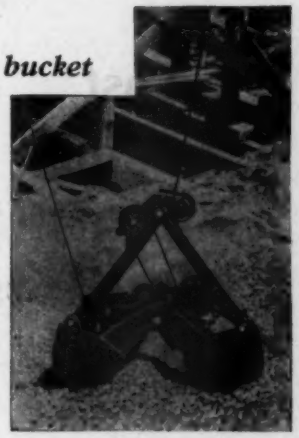
Three "applicants" were tried out for this job—*Then they got the bucket that "filled the bill"*



Here's one concern that had such a tough job for a bucket that they were willing to give any likely "applicant" a thorough trial.

Three different buckets had a shot at the job, but the clay was just a little too hard to penetrate when dried out—or else they couldn't dump fast enough when the clay was wet and sticky.

Then a WILLIAMS "Favorite" tackled the work. Drop in for a visit any time, at the Schultz plant, Little Ferry, N. J., and watch it in action—you'll see at once why this bucket got the job *permanently*. Watch its powerful bite and quick dumping.

Write us for photos and complete details of a WILLIAMS that will give you bigger output on *any* kind of digging—

G. H. WILLIAMS COMPANY, 603 Hayburger Lane, Erie, Pa.
Branch Offices: New York, Pittsburgh, Chicago

WILLIAMS
FAST-DIGGING BUCKETS
All Parts Guaranteed Against Breakage

SHOTS FROM THE FIRING LINE — Cont.

The Mistassini Power and Paper Company are going ahead shortly with the construction of their pulp mill at Mistassini, Province of Quebec. It is possible that about 30 miles of railway will have to be built into this plant. If so, it will very likely be built by the Canadian National Railroad.

Alex. Finlayson, who has been in Montreal for some time, is reported to have gone East to Nova Scotia. It is rumored that the coming general elections have drawn this great politician to his home territory.

We had a visit recently from Phillip Pagano. He has some big things in the air, which, if they develop, will keep him quite busy for some time.

Mike McManus of Halifax, not finding the East very good hunting grounds, at the present time, came up to Montreal to look around. He has landed a sewer contract at St. Lambert, Province of Quebec.

Gorman & Peckham are working steadily for the Aluminum Company at Arvida. They are at present building a big trestle, completing the line of railway.

The Aluminum Company of Canada are operating two Bucyrus 70-ton shovels in gravel pits, getting out material for their railroad and also for house foundations.

Toronto and Vicinity

BY C. F. ENGLAND

J. P. Porter & Sons were awarded contract for Section 4-B, New Welland Ship Canal.

The Godson Contracting Co., Limited, have a contract from the Ontario Department of Public Highways for some seven miles of asphalt road on the upper end of Yonge Street.

The Atlas Construction Co., Limited, have been awarded contract by The Canadian National Railways for the erection of several buildings in Toronto. This is a further step in connection with the new viaduct scheme — different other contracts were awarded at an earlier date.

W. E. Taylor is doing considerable sewer and water main work in this city and vicinity.

Vancouver and Vicinity

BY J. C. MOON

Watson, Stewart & Kennedy of Vancouver, British Columbia, have secured a contract for the erection of a road bridge over the Quesnel River at Quesnel, British Columbia, at a cost of around $45,000, which covers the cost of the bridge only. The Provincial Government will do the necessary fill work, which will bring the total cost up to about $70,000.

New York capital is said to be behind a project now on foot in Vancouver to build a new hotel of 512 rooms at a cost of $2,700,000. It is rumored that this might be leased to the Canadian National Railways.

Contractor S. S. Magoffin has made a good start on his contract for extending the Vancouver Harbor Commissioner's Terminal Railway system on the North Shore. He has one shovel at work already, and a Bucyrus 70-ton is expected to commence work in a short time.

Cost Cutting "SCHRAMM" Compressors

"SCHRAMM" No. 120 Operating Drill on Sewer Job

Three Reasons Why:

Does the work of ten men working by hand.
Fuel consumption regulated by slow down governor.
Easy to move from one job to another.

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They Are All Turning to Koppel

Why? Because this Automatic Air Dump Car of Koppels is a revelation in speed, quick, clean discharge—in strength and low upkeep. Contractors everywhere, including Guthrie, Foley, Waugh, Vang, Boxley, etc., prefer it because it is a better car. *Ask for literature.*

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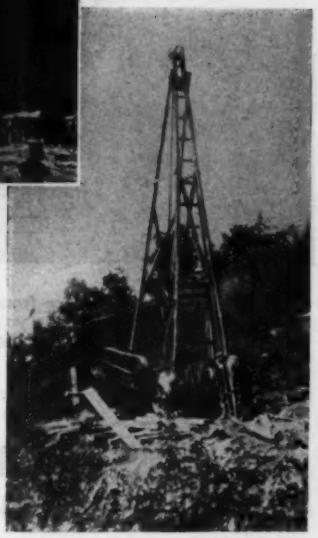
CYCLONE DRILLS

—on the S. I. and K. R. R. job.



THERE was a great deal of heavy rock work on the Southern Illinois and Kentucky Railroad job. Twenty-three blast hole drills of the well driller type were used by the several contractors. Twenty-one of these twenty-three were Cyclone Drills. The machines shown belong to A. Guthrie & Co., Inc.

Our book *"Big Blast Hole Drills"* (120 pages) is of interest to anyone interested in heavy rock excavation. Ask for a copy.

The Sanderson-Cyclone Drill Co.
Orrville, Ohio
Eastern and Export Office: 30 Church St., New York

SHOTS FROM THE FIRING LINE — Cont.

Pacific Engineers, Limited, have secured a contract from the British Columbia Electric Railway Co. for the widening and extension of the old Mission Trail, near their Bridge River power project. This work is necessary to enable construction material to be taken in for work on the proposed power tunnel, which forms part of the new power development scheme. The contract amounted to about $75,000.

Armstrong, Morrison & Co. were awarded a contract for paving Dunbar Street in Point Grey District, at a figure of $114,000.

The Northern Construction Co., Limited, and J. W. Stewart were awarded the contract for a new power house for the British Columbia Electric Railway Co. at the mouth of the new tunnel connecting Alouette Lake with the Stave River.

Building permits in Vancouver continue to show a steady increase, and amounted in July to about $6,000,000 for the whole of Greater Vancouver.

TRADE NOTES

The Republic Motor Truck Company, Inc., Alma, Michigan, has established a system of factory branches on the West Coast extending from Los Angeles, California, to Portland, Oregon. Within the past month three of these factory branches have been opened up and are now in full operation, one in Los Angeles, one in San Francisco and one in Portland. A factory manager is in charge of each branch, while the entire West Coast branch system is under the personal supervision of Mr. R. H. Spencer.

Mr. L. J. Belnap has just been elected president of the *Worthington Pump and Machinery Corporation*. Mr. C. Philip Coleman, retiring president, was elected chairman of the board. Mr. Belnap was formerly president of Rolls Royce of America and chairman of Wills St. Claire Company of Detroit.

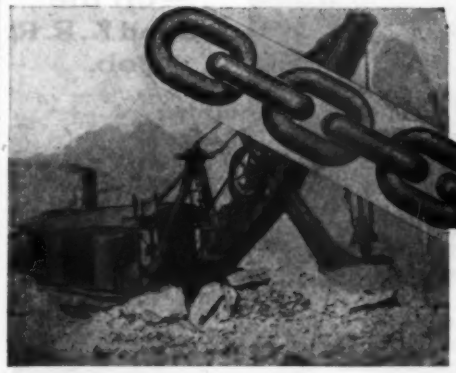
T. E. Doremus, at present manager of the Seattle, Washington, office of the Explosives Department of *E. I. du Pont de Nemours & Company*, has been appointed manager of the New York office of the Explosives Department, succeeding the late Frederick C. Peters. He will assume his new duties August 1st.

The *Fairbanks, Morse & Company, Chicago, Illinois*, has recently issued a 32-page bulletin known as "Economy of Diesel Engine Power." The bulletin takes up an analysis of the various factors which affect the cost of power, such as fuel, operating labor, maintenance, first cost and fixed charges, reliability and simplicity and many other such interesting chapters. The bulletin will be sent without charge on request to the company at Chicago.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

INDUSTRIAL CHAIN DRIVES — A miniature catalog issued recently by the *Boston Gear Works Sales Company, Norfolk Downs, Massachusetts*, which illustrates and describes the various chains manufactured by this company. A copy of the catalog may be had upon addressing the above.



"You get in service from an article just what you pay for is a good thing to remember."

Why Take a Chance?

The Hoisting Chain on your shovel is the sinew of the equipment. Steady production depends upon the chain to give uniform service.

TAYLOR MESABA

POWER SHOVEL CHAINS—

Have been making yardage records for over 50 years, keeping the shovel on the job day in and day out, resulting in low *chain maintenance cost* and establishing production records.

S. G. Taylor Chain Company

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THE development of Hercoblasting illustrates a practical application of our belief that it pays to save money for customers, even at our own expense. Temporarily at least, it costs us money every time we persuade a customer to replace Hercules high explosives with the cheaper Herco Blasting Powder.

This method is often applicable where column loading is used in well-drill holes, and where it can be used it gives results equal to dynamite, at a saving sometimes as high as 35%.

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Please send me a free sample copy of the March 1926 number of THE EXPLOSIVES ENGINEER containing an article giving complete details on Hercoblasting Limestone in Wisconsin.

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*City*_____ *State*_____

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A fully-developed section of hillside homes. The hills in the background will be developed as the project progresses.

Carving out the hillside. All material here is overcast.

Digging on the road work. The shovel is dumping into White 5-ton truck. Note second shovel working on crest of hill.

Two of Mack Sennett's Bathing Beauties Take a Little Ride in the Dipper of One of the Shovels.

Under the Dipper Sticks for a Good View of the Finished Highway Winding Along the Hillsides.

Up in the Air Cutting Through a Hilltop for the Highway